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Notes on the Asclepiadaceae of China

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ABSTRACT. This paper is a precursor to the account of the Asclepiadaceae in the *Flora of China*. A new genus and species, *Sichuania alterniloba*, is described. Twenty-four new species are described in *Biondia* (*B. crassipes*, *B. laxa*, *B. parviurnula*, *B. revoluta*, and *B. tsiukowensis*), *Ceropegia* (*C. sinoerecta*), *Cynanchum* (*C. bicampanulatum*, *C. brevicoronatum*, *C. duclouxii*, *C. kingdonwardii*, *C. longipedunculatum*, *C. megalanthum*, *C. ping-shanicum*, *C. rockii*, and *C. sinoracemosum*), *Hoya* (*H. commutata* and *H. mekongensis*), *Marsdenia* (*M. brachyloba*, *M. tenii*, and *M. yuei*), and *Tylophora* (*T. forrestii*, *T. rockii*, *T. tuberculata*, and *T. uncinata*). *Jasminanthes* is resurrected. Eleven new combinations are proposed in *Ceropegia* (*C. exigua*), *Cynanchum* (*C. boudieri* subsp. *caudatum*), *Heterostemma* (*H. menghaiense*), *Hoya* (*H. chinghungensis*), *Jasminanthes* (*J. chunii*, *J. mucronata*, *J. pilosa*, and *J. saxatilis*), and *Tylophora* (*T. costantiniana*, *T. oligophylla*, and *T. tsiangii*). The new name *Cynanchum triangulare* is proposed to replace *C. deltoideum* Hooker, not Hance. New synonymy is proposed in *Cynanchum*, *Lygisma*, *Marsdenia*, and *Tylophora*. The status of *Merrillanthus* is discussed.

The following new taxa and new combinations are required for the forthcoming account of the Ascle-

piadaceae for the *Flora of China*. Some new synonymy is also presented. The taxa are arranged alphabetically.

Biondia Schlechter.

Biondia, a genus of 13 species endemic to China, is characterized by narrow leaves with minute pale dots on the adaxial surfaces, small flowers mostly with well-developed corolla tubes, and reduced, often annular, coronas. Such leaf dots are also seen in some species of *Tylophora*, but they have restricted occurrence in genera related to *Biondia*. The most important exception is *Cynanchum thesioides* K. Schumann, which also has narrow leaves. This species is somewhat isolated in *Cynanchum* and has been placed in its own genus, *Rhodostegiella* C. Y. Wu & D. Z. Li. There is perhaps a case for regarding it as a *Biondia* with a more normally developed corona than usual.

Most species of *Biondia* are too poorly represented in herbaria to establish patterns of variation, and it is difficult to have much confidence in species delimitation. A number of collections cannot be placed within the known range of variation of existing taxa. These are herein described as distinct species. It is likely that more information on variation within spe-

cies will require a reassessment of the number of species recognized.

Biondia crassipes M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Sichuan: Yijiang Xian, 2700 m, 10 Sep. 1977, B. Z. Guo & W. Y. Wang 23624 (holotype, HNWP 88274).

Species nova *Biondiae tsiukowensi* M. G. Gilbert & P. T. Li similis sed ab ea foliis angustatis nervatione laterali non prominenti, rachidibus inflorescentiarum plus minusve pedicellos aequantibus, rachillis cymularum elongatis plus minusve incrassatis differt.

Twining herbs. Stems puberulent along 2 sides and at nodes. Petioles 2–4 mm, adaxially densely puberulent; leaf blades linear-oblong, to 5×0.3 cm, paler abaxially, base cuneate, apex acute; midrib raised adaxially, lateral veins obscure, glabrous. Inflorescences 2–3.5 cm, mostly with two cymules separated by a rachis ca. as long as pedicels; rachillas of cymules slightly elongated and \pm fleshy, very sparsely puberulent. Pedicels 6–10 mm. Sepals elliptic, ca. 1.5×0.6 mm, sparsely puberulent. Corollas apparently green, bell-shaped, 2.5 mm, exterior glabrous, interior minutely hairy, hairs short, stiff, white; tube ca. 1.5 mm; lobes triangular, revolute, twisted. Coronas reduced to inconspicuous collar concealing bases of anthers. Pollinia oblong-reniform. Follicles solitary, narrowly fusiform, ca. 5.5×0.4 mm.

The narrow leaves and small flowers of *Biondia crassipes* suggest a relationship to *B. longipes* P. T. Li and *B. revoluta*. The corolla form is most similar to those of *B. microcentra* (Tsiang) P. T. Li and *B. tsiukowensis*, while the lax inflorescence is similar to that in *B. laxa*. *Biondia crassipes* differs from all other species of *Biondia* by the slightly elongated and distinctly thickened rachillas of the cymules; all other species have contracted umbelliform cymules. *Biondia longipes* differs further from *B. crassipes* by the glabrous corollas, while *B. revoluta* differs by the longer and more distinctly tubular corollas.

Biondia laxa M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Ouei cha (Yunpe), 13 May 1920, Tén 404 (holotype, E).

Species nova *Biondiae insigni* Tsiang similis sed ab ea foliorum nervis lateralibus utroque costae latere 4–6, omnibus similibus, rachidi inflorescentiae longa cymulas plerumque 3 gerente differt.

Twining herbs. Stems densely pubescent along 2 sides. Petioles to 7 mm; leaf blades lanceolate, $4.5\text{--}6 \times 1.2\text{--}2$ cm, glabrous, base rounded, apex acute;

lateral veins 4–6 pairs, at ca. 45° to midrib, all similar, adaxially slightly raised and minutely puberulent. Cymes extra-axillary; peduncles to 2.5 cm, glabrous; cymules umbel-like, up to 3 along zigzag rachis to 2 cm. Pedicels 1–1.3 cm, very slender. Sepals ovate, ca. 1×0.5 mm, glabrous or sparsely pilose on margins. Corolla tubes bowl-shaped, ca. 1 mm, much shorter than lobes; lobes triangular-acuminate, ca. 2.5 mm, revolute, apex twisted, very minutely puberulent. Coronas \pm annular with fleshy, square to \pm rounded lobes to base of anthers. Gynostegium slightly exerted from corolla tube; pollinia cylindric, as long as corpusculum. Fruits not seen.

Biondia laxa is immediately separable from all other members of the genus by the inflorescence, which has a distinct rachis to 2 cm long and up to three separate umbel-like cymules. Older leaves have thick, pale veins very similar to those of the closely related *B. insignis*. However, *B. insignis* has a distinctive leaf venation with two major lateral veins at an acute angle to the midrib, as well as up to eight pairs of minor veins at a wider angle. *Biondia insignis* also differs by the ringlike corona.

Paratypes. CHINA. Xizang (Tibet): Rong Tö Valley, Layul, 1800 m, 20 Apr. 1933, Kingdon-Ward 10352 (BM). Yunnan: Lao Kouy Chan, near My lé, 1906, P. Ngueou in Ducloux 4171 (P); Shweli-Salwin Divide at $25^\circ 30'N$, 2700 m, Aug. 1917, Forrest 15718 (BM, E).

Biondia parviurnula M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Anhui: Jinzhai, Guan Cai Gou, Bai Ma Zhai, 800 m, 4 Mar. 1984, K. Yao 8956 (holotype, A; isotype, K).

Species nova *Biondiae hemsleyanae* (Warburg) Tsiang similis sed ab ea nervatione foliorum prominentiore, inflorescentiis minimis, corollis minoribus urceolatis differt.

Twining herbs. Stems densely minutely puberulent along 2 sides. Petioles to 7 mm, adaxially puberulent; leaf blades lanceolate, to 6.5×2.2 cm, base rounded, apex acute-apiculate, glabrous except for adaxially densely puberulent midrib; lateral veins 3 or 4 pairs, slightly raised on both sides; upper leaves relatively narrower, \pm elliptic to elliptic-oblong. Inflorescences umbel-like, ca. 4-flowered; peduncles ca. 2 mm, puberulent. Pedicels 1.5–2 mm, glabrous. Sepals lanceolate, ca. 1.5×0.7 mm, apex acute, pubescent, somewhat glabrescent. Corollas urn-shaped, 3–3.5 mm, interior pale purple, exterior glabrous; tube ca. 2.5×2 mm, throat ca. 1.2 mm wide, interior sparsely hairy; lobes ovate, ca. 1.2 mm, apparently not revolute. Corona a collar covering bases of anthers, thin when dried. Stigma head conical. Fruits not seen.

The type of *Biondia parviurnula* was identified as *B. hemsleyana*, but *B. parviurnula* is readily distinguished by having leaves with more prominent venation, very small inflorescences (less than 1 cm long), and smaller, more distinctly urn-shaped corollas. The corolla of *B. parviurnula* is most similar to those of *B. microcentra* and *B. yunnanensis* (H. Léveillé) Tsiang but is glabrous inside. The type material also differs from those species by having internodes with two lines of pubescence.

Biondia revoluta M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. NW Yunnan/E Xizang (Tibet): Tung-chu-ling, 3000 m, May 1913, *Kingdon-Ward 310* (holotype, E).

Species nova *Biondiae pilosae* P. T. Li similis sed ab ea internodiis bilateraliter pubescentibus, foliis manifeste revolutis nervatione laterali prominentiore, pedicellis longioribus differt; a speciebus aliis lobis corollarum tubum aequantibus differt.

Twining herbs. Stems hairy along 2 sides. Petioles to 3.5 mm, puberulent; leaf blades linear-oblong, to 2.8–6 × 0.4–0.55 cm, base ± rounded, margins strongly revolute, apex subacute, apiculate, glabrous except for adaxial midrib, lateral veins not raised, underside distinctly paler, wrinkled when dried, probably fleshy when fresh. Peduncles 1–1.5 cm, hairy along 1 side; cymules umbel-like, 2–4-flowered, solitary or 2 separated by rachis to 5 mm, puberulent. Pedicels 7–9 mm, glabrous. Sepals ovate, 0.7–1 × 0.5–0.7 mm, sparsely puberulent, apex acute. Corollas bell-shaped, inside minutely puberulent, 2.5–3.5 mm, lobes ovate, ca. 1.5 × 1.5 mm, apex rounded, slightly revolute. Coronas annular, obscurely 5-toothed. Fruits not seen.

Biondia revoluta is most closely related to *B. pilosa*, which differs by having internodes with only one line of hairs, leaves with acuminate apices and more conspicuous lateral veins, and shorter peduncles. The collection from Gansu (*Wang 19120*) has smaller leaves and flowers than the type collection, and the lateral leaf veins are distinctly darker than the lamina and are not raised. In all other respects, it is a good match and is included here as a paratype despite the disjunct distribution.

Paratype. CHINA. Gansu: Wen Xian, 1500 m, 30 Apr. 1966, Z. B. Wang 19120 (HNWP).

Biondia tsiukowensis M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Salween-Mekong Divide, Tsiu kow, 2400 m, May 1911, *Kingdon-Ward 110* (holotype, E).

Species nova *Biondiae microcentrae* similis sed ab ea internodiis bilateraliter pubescentibus, pedunculis longioribus, lobis corollinis ca. $\frac{3}{8}$ partes longitudinis tubi aequantibus differt.

Twining herbs. Stems densely pubescent along 2 sides. Petioles ca. 6 mm, adaxially puberulent; leaf blades lanceolate, ca. 6 × 1.2 cm, glabrous except for veins, base rounded, apex ± acute, slightly apiculate; lateral veins 5–7 pairs, adaxially slightly raised and minutely puberulent, at an acute angle to midrib. Cymes umbel-like; peduncles 2–18 mm, almost glabrous. Pedicels to 11 mm. Sepals ovate, ca. 1.4 × 0.7 mm, glabrous. Corolla tube bell-shaped, ca. 2.3 mm long, longer than lobes; lobes triangular-acuminate, 2 × 1.4 mm, revolute toward apex, minutely puberulent inside. Corona lobes ± square, reaching base of anthers. Gynostegium ca. 1.4 mm high; pollinia cylindrical, as long as corpusculum. Fruits not seen.

Biondia tsiukowensis is distinguished from other species of *Biondia* by having longer peduncles and corolla lobes only slightly shorter than the tube. Other species of *Biondia* have corolla lobes either less than half as long as or distinctly longer than the corolla tube. It also differs by its more or less square corona lobes that reach the bases of anthers. *Biondia microcentra* is in some ways most similar because it also has the lateral veins of the leaves raised adaxially and a hairy interior to the corolla, but it differs markedly by having much shorter (to 4 mm) peduncles and pedicels.

***Ceropegia* L.**

Ceropegia, which includes about 170 species mostly in Africa, is represented in China by 17 species.

Ceropegia exigua (Huber) M. G. Gilbert & P. T. Li, comb. et stat. nov. Basionym: *Ceropegia longifolia* Wallich subsp. *exigua* Huber, Mem. Soc. Brot. 12: 42. 1957. TYPE: China. Sichuan: Tung Valley, *Wilson 4112* (holotype, BM; isotypes, K, P).

Ceropegia exigua is perhaps the most distinctive member of the *C. longifolia* Wallich complex. It can be recognized instantly by the very short corolla lobes, which are abruptly contracted from the prominently spreading top of the corolla tube to form a short narrow beak, even when the flower is fully open. The corolla lobes in the other members of this group are much longer (usually at least three-fourths as long as the corolla tube, sometimes longer), and the upper part of the tube does not spread and

passes much more gradually into the lobes, which are not abruptly contracted into a beak. Furthermore, in *C. exigua* the corolla lobes are only slightly darker than the rest of the corolla and are quite coarsely pilose, while in the rest of the complex, as in many other species in the genus, the corolla lobes are deeply colored and finely and densely pubescent, contrasting greatly with the rest of the corolla.

Ceropegia sinoerecta M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: au pied du Hee Chan men (Ho Kin), 2000 m, 30 May 1887, Delavay 2625 (holotype, P).

Species nova *Ceropegiae mairei* (H. Léveillé) Huber similis sed ab ea corollae angustioris basi quam ostio latiore lobis linearibus fere ad basim atratis manifeste differt; a *C. wallichii* White partibus omnibus gracilioribus differt.

Erect herbs. Rootstock a cluster of fusiform roots. Stems erect, to 20 cm, uniformly finely puberulent. Petioles 4–6 mm, narrowly winged; leaf blades elliptic, 2–5 × 0.6–1.6 cm, base cuneate, apex acute, lowermost leaves sometimes cuspidate, abaxially pale and sparsely hairy on veins only, adaxially densely puberulent. Peduncles 4–17 mm. Cymules umbel-like, 2–4-flowered, sometimes producing a second cymule separated by a short rachis. Pedicels 5–17 mm. Sepals linear-lanceolate, ca. 3 × 0.6 mm, glabrous. Corollas 3.6–4.3 cm, glabrous except for lobes, tube dark for basal half, pale for apical half, basal swelling ovoid, 4–6 mm wide, tube 1.3–1.6 mm wide, increasing gradually to 3.5–5.5 mm at base of lobes; lobes darkly colored almost to base, minutely puberulent, 14–15 mm, linear, slightly curved inward at base, otherwise parallel except for sharply incurved tip. Outer corona lobes each with 2 linear teeth ca. 1.5 mm, ciliate; inner corona lobes linear, ca. 2.5 mm, erect. Fruits not seen.

Ceropegia sinoerecta is perhaps most closely related to *C. mairei*, from which it differs by the more slender flowers widest at the basal inflation and by the differentiated corolla tips extending almost to the base of the lobes instead of less than halfway down. *Ceropegia wallichii* White (Nepal and western Himalayas), which also has erect stems and similarly shaped corollas, is a robust plant with unusually thick stems and much larger leaves and flowers, whereas *C. sinoerecta* is delicate in all features.

The holotype has simple umbel-like inflorescences and parallel corolla lobes, while the paratype has inflorescences with pairs of umbels separated by a distinct rachis and corolla lobes bowing slightly outward. More collections are needed to properly assess the significance of these differences. There are sev-

eral other collections by Delavay numbered as 2625, but these differ in details of date and locality, and all belong to *C. mairei*.

Paratype. CHINA. Yunnan: Kou ty près Pin tchouay, Apr. 1907, Jean Py in Ducloux 5305 (P).

Cynanchum L.

With 57 species, *Cynanchum* is the largest and most difficult genus of Chinese asclepiads. It is being treated here in the wider sense, i.e., including *Vincetoxicum* N. M. Wolf, *Cyathella* Decaisne, and *Rhodostegiella*. When the group as a whole is considered, it is currently not possible to define adequate discontinuities among the potential segregate genera.

Cynanchum acutum L. subsp. ***sibiricum*** (Willdenow) F. Reehinger, Fl. Iranica, Asclepiadaceae 9. 1970. *Cynanchum sibiricum* Willdenow, Ges. Naturf. Freunde Berlin Neue Schriften 2: 124. 1799. TYPE: B-WILLD 5233 (microfiche).

Cynanchum cathayense Tsiang & Zhang, Acta Phytotax. Sin. 12: 110. 1974. Syn. nov. *Cyathella cathayensis* (Tsiang & Zhang) C. Y. Wu & D. Z. Li, Acta Phytotax. Sin. 28: 465. 1990. TYPE: China. Gansu: Chiu-Chuan Hsien, 1350 m, 2 Dec. 1956, R. C. Ching 30 (PE).

Cynanchum cathayense was not compared with *C. acutum* in the protologue. Numerous collections from Xinjiang match the description of *C. cathayense* and are not separable from *C. acutum* subsp. *sibiricum*. There seems to be no alternative but to include *C. cathayense* in that taxon.

Cynanchum acutum L. subsp. *acutum* is widespread in the Mediterranean region from Spain east to Turkey, where there is an area of overlap with *C. acutum* subsp. *sibiricum*. It differs by the ovate leaves with convex rather than concave sides, but individuals with hastate leaves are found from throughout the range, and it does not seem possible to treat the two as species.

Cynanchum ascyrifolium (Franchet & Savatier) Matsumura, Ind. Pl. Jap. 2, 2: 509. 1912. *Vincetoxicum ascyrifolium* Franchet & Savatier, Enum. Pl. Jap. 2: 441. 1879. TYPE: "prob. ins. Nippon, cum *V. multinerve* mixtum, ex Tanaka accepit Dr. Savatier" (holotype, P).

Cynanchum ascyrifolium has been used widely recently in both Japan and China for a very distinctive erect plant with large membranous acuminate leaves and small inflorescences. Unfortunately,

the type of *C. ascyrifolium* is a plant with oblong-elliptic leaves with a thick texture and rounded-apiculate tips. It is clearly different from any other species known to us. The correct name for most material commonly included under *C. ascyrifolium* is *C. acuminatifolium* Hemsley.

Cynanchum auriculatum Royle ex Wight, Contr. Bot. India 58. 1834. SYNTYPES: India. Kaimoun, Wallich 8228 ("asclep. 137") (K-WALL); Kimour, Royle s.n. (LIV not seen).

Cynanchum saccatum W. T. Wang in Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 91. 1974. Syn. nov. TYPE: China. Xizang (Tibet): Chang-Tu, Chi-natung, Tsa-wa-rung, 3000 m, Aug. 1935, C. W. Wang 65215 (holotype, IBSC).

Cynanchum saccatum was described without the examination of authentic material of *C. auriculatum*, from which it is indistinguishable. Specimens of *C. boudieri* were often misidentified as *C. auriculatum*, but *C. boudieri* has strongly reflexed corollas, whereas *C. auriculatum* has rotate corolla lobes.

Cynanchum bicampanulatum M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Sichuan: Kangting (Tachienlu), 2700 m, 11 July 1934, Harry Smith 10443 (holotype, UPS; isotypes, MO, S).

Species *Cynancho vincetoxico* sensu lato affinis sed ab eo corollis coronisque campanulatis, lobulis coronae ad antheras corollasque adnatis facile distinguenda.

Herbs. Roots many, little branched, fleshy. Stems forming fairly dense cluster, little branched, erect or ascending, to 30 cm, minutely puberulent mainly along 2 sides. Petioles 3–9 mm; leaf blades oblong-ovate, 5.5–7 × 4–4.5 cm, base shallowly cordate, truncate or rounded, apex acute to slightly acuminate; basal veins 5–7, lateral veins 4 or 5 pairs, glabrous or minutely puberulent on some. Inflorescences ± umbel-like, cymes several flowered, separated by a very short rachis; peduncles (5–)8–18 mm, puberulent; bracts linear, 0.9–2 mm. Pedicels 5–8 mm (to 12 mm in fruit), puberulent. Sepals oblong, ca. 1.5 × 0.5 mm, apex rounded, almost glabrous. Corollas bell-shaped, ca. 4 mm; glabrous except for a few stiff hairs within tube, purple (fide Guo & Wang 21046); tube ca. 2 × 3 mm; lobes oblong-ovate, ca. 1.7 × 1.5 mm, apex rounded, usually revolute. Corona tube ± as high as anthers, membranous with inflexed, rounded, fleshy lobes, adnate to corolla tube and to anthers opposite lobes. Anthers square, slightly gibbous; anther appendage ovate, inflexed over stigma head; pollinia ovoid, ca.

0.2 mm. Stigma head dark, rounded. Follicles paired or solitary, spreading, glabrous, beaked-fusiform, at least 3.5 × 1.5 cm.

Distribution and ecology. China, Gansu and Sichuan Provinces. In open fields ("prato aprico"); 2570–2700 m.

At first glance *Cynanchum bicampanulatum* looks very similar to some of the forms of *C. forrestii* Schlechter, a member of the *C. vincetoxicum* (L.) Persoon complex. However, in *C. bicampanulatum* the corolla and corona are campanulate, in contrast to the shallow-tubed, rotate corolla and bowl-shaped corona of members of that complex. *Cynanchum stenophyllum* Hemsley resembles *C. bicampanulatum* in having the corona adnate to both the anthers and corolla tube but differs in having narrow leaves and almost no indumentum.

Paratypes. CHINA. **Gansu:** Erh-lau-shan ad Minchow, 2570 m, 30 June 1930 (fl), Hummel 3894 (S); Minchow, 2410 m, 8 Sep. 1930 (fr), Hummel 5097 (S). **Sichuan:** Daofu Xian, 5 July 1977 (fl), Guo & Wang 20861 & 21046 (HNWP).

Cynanchum boudieri H. Léveillé & Vaniot, Bull. Soc. Bot. France 51: CXLIV. 1904. TYPE: China. Sichuan: Kouy-Tchéou, Pin-fa, ruisseau du Tu-chang, 5 Oct. 1902, Cavalerie 620 (holotype, E).

Cynanchum amphibolum C. K. Schneider in Sargent, Pl. Wils. 3: 346. 1916. Syn. nov. TYPE: China. Hubei Province: Patung Hsien, Aug. 1907, Wilson 2247 (holotype, A; isotype, K).

Cynanchum boudieri* subsp. *caudatum (Miquel) P. T. Li, M. G. Gilbert & W. D. Stevens, comb. et stat. nov. Basionym: *Endotropis caudata* Miquel, Ann. Mus. Bot. Lugduno-Batavum 2: 128. 1866. TYPE: Japan, Keiske (?) (not seen).

The Chinese material of *Cynanchum boudieri*, which has often been misidentified as *C. auriculatum*, has elongated inflorescences, whereas the Japanese collections have umbelliform inflorescences. Plants of the two countries are otherwise very similar, and they are best treated as subspecies.

Cynanchum brevicoronatum M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Hubei (Hupeh): Ichang, A. Henry 6418 (holotype, BM; isotypes, K, P).

Species *Cynancho wallichii* similis sed ab eo calyce reflexo corona brevissima cupuliformi membranacea integra appendicibus carente facile distinguenda.

Twining herbs. Stems puberulent along 1 line. Petioles to 3 cm; leaf blades abaxially slightly glaucous, ovate or ovate-triangular, $6-7.5 \times 3-4.2$ cm, base cordate, apex acute to slightly acuminate, basal lobes \pm incurved, adaxially very sparsely and minutely hairy, abaxially puberulent on veins, sometimes pale gray-green; basal veins 3(-5), lateral veins 2 or 3 pairs; axils often with reduced stipule-like shoots. Inflorescences simple, shortly and densely raceme-like, to 1.5 cm; peduncles 1-5 mm, puberulent; cymules 2-flowered. Pedicels to 5.5 mm, pubescent. Sepals lanceolate, ca. 1.5×0.7 mm, ciliate, minutely puberulent outside, strongly reflexed at anthesis. Corollas \pm erect, lobes oblong-ovate, ca. 3.5×1.7 mm, slightly fleshy, glabrous. Coronas a shallow \pm membranous cup ca. half as high as gynostegium, internal appendages absent. Gynostegium ca. 2.5 mm high; anther appendages ovate, acute. Follicles often solitary, lanceolate in outline, ca. 6×1.5 cm.

Distribution. China in the provinces of Hubei and Sichuan. There is no information on ecology.

The corona in *Cynanchum brevicoronatum* is so short that at one point it was suspected to be a growth abnormality, but the flowers seem uniform and fully functional. Initially *C. brevicoronatum* was confused with *C. decipiens*, which also has a short corona, but closer examination shows that the corona is much shorter, membranous rather than fleshy, and lacks the inner appendages seen in *C. decipiens*. Another distinctive feature of *C. brevicoronatum* is the reflexed sepals. It is probably most closely related to species such as *C. wallichii* Wight and *C. callialatum* Hamilton ex Wight. Similar very short coronas are seen in *Biondia*, which can easily be distinguished by the much narrower leaves with pale dots on the adaxial surface and the distinctly fleshy corona.

Paratype. CHINA. **E Sichuan:** Tchen-kéou-tin, *Farges 92 bis* (P).

Cynanchum duclouxii M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Yunnansen, 3 Aug. 1904, *Ducloux 176* (holotype, E).

Species *Cynancho kintungensi* similis sed ab eo corolla parva lobis erectis, corona brevioribus differt, ab speciebus aliis appendicibus coronae parvis vel reductis plus minusve minute longitudinaliter bicarinatis pilis caulium unifariis distinguenda.

Twining herbs. Stems puberulent along 1 line. Petioles 2.5-3.2 cm; leaf blades triangular-ovate, $4.5-8 \times 1.7-5.1$ cm, adaxially uniformly minutely puberulent, abaxially slightly paler and glabrous except for puberulent veins, base deeply cordate, basal

lobes slightly enlarged, sometimes overlapping, apex acute to slightly acuminate, basal veins 3-5, pedate, lateral veins 2 or 3 pairs. Inflorescences raceme-like, sometimes terminal on short axillary branches; peduncles 0.7-5.5 cm; rachis to 1.5 cm; cymules 2-flowered, in a lax spiral. Pedicels to 6 mm, puberulent. Sepals ovate, ca. 1×0.8 mm, sparsely puberulent, apex acute. Corollas white, \pm erect, deeply divided, lobes $2.5-3 \times 1-1.4$ mm, glabrous outside, minutely puberulent inside. Coronas membranous, prominently 5-lobed, tube ca. as high as middle of anthers, shorter than lobes; lobes longer than anther appendages, often inflexed, with 2 prominent adaxial gibbosities at base, rarely with a small adaxial appendage. Anther appendages ovate, acute, prominent. Follicles solitary, lanceolate in outline, ca. 6.5×0.9 cm, base tapered, apex slightly acuminate.

Distribution. China, Yunnan and Sichuan Provinces. Bushland in valleys; no indication of altitude.

Cynanchum duclouxii is related to *C. wallichii* Wight, *C. sinoracemosum* M. G. Gilbert & P. T. Li, and *C. kintungense* Tsiang. From these, *C. duclouxii* is separated by its smaller flowers with erect corolla lobes and its coronas, which are shorter than the anthers. In *C. wallichii* the corolla lobes are reflexed, whereas in *C. kintungense* they are spreading, and in both species the corona tube is longer than that of *C. duclouxii*. The characters separating *C. duclouxii* from *C. sinoracemosum* are listed under the latter.

Paratypes. CHINA. **Sichuan:** Tianquan Xian, Erlong Mountain, 14 Aug. 1953, X. Y. Jiang 35246 (HNWP). **Yunnan:** Yunnansen, E. E. Maire 1141 (E).

Cynanchum kingdonwardii M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Yunning, 29 June 1922, *Kingdon-Ward 5266* (holotype, E).

Species *Cynancho callialato* similis sed ab eo laminis foliaribus linearilanceolatis basibus cuneatis manifeste distinguenda.

Twining herbs. Internodes with poorly defined line of pubescence. Petioles to 11 mm; leaf blades linear-lanceolate, to at least 11×1.2 cm, adaxially thinly puberulent, abaxially glabrous, base cuneate, apex acute; lateral veins ca. 10 pairs. Inflorescences umbel-like; peduncles to 3 mm, pubescent along 1 side. Pedicels to 7 mm, puberulent. Sepals lanceolate, ca. 2×0.8 mm, thinly hairy. Corollas very pale green, deeply divided, glabrous; lobes oblong-lanceolate, ca. 5×2.4 mm, blunt. Coronas white, cup-shaped, ca. 2.5 mm high, membranous, adnate to anthers, mar-

gin with 5 low, acute teeth, smooth adaxially. Gynostegium slightly higher than corona; anther appendages narrowly ovate. Fruits not seen.

Distribution and ecology. China, Yunnan Province. On scrub-clad limestone slopes, in shade, at 3000–3300 m.

Cynanchum kingdonwardii resembles *C. callialatum* and *C. wallichii* in having cup-shaped coronas with reduced or no internal appendages. It differs from those and all related species by the linear-lanceolate leaf blades with cuneate bases, instead of more or less ovate blades with deeply cordate or sometimes rounded bases.

Cynanchum longipedunculatum M. G. Gilbert & P. T. Li, sp. nov. TYPE: "Western China," 12,000 ft. [3600 m], June 1904, *Wilson 4103* (holotype, BM; isotype, P).

Species *Cynancho decipiens* affinis sed ab eo inflorescentiis subcapitatis pedunculis longioribus corona longiore cupuliformi non carnosae differt.

Twining herbs. Stems puberulent along 1 side. Petioles ca. 2.5 cm, slender; leaf blades lanceolate, ca. 5.6×2.3 cm, adaxially uniformly puberulent, abaxially slightly glaucous, hairy on veins only, base deeply cordate with incurved, often overlapping, basal lobes, apex long-acuminate; basal veins usually 7, lateral veins 3 or 4 pairs. Inflorescences long pedunculate, umbel-like, very congested; peduncles 6–9 cm, longer than subtending leaf, densely hairy on 1 side; cymules usually all aggregated, sometimes an isolated flower below main inflorescence. Pedicels 3.5–6 mm, puberulent on 1 side. Sepals oblong-lanceolate, ca. 2×0.9 mm, puberulent, sometimes only on margins. Corollas white (fide Wilson), exterior glabrous, interior densely pilose, tube ca. 0.5 mm; lobes ca. 5.5×1.7 mm, \pm erect. Coronas cup-shaped, longer than stigma head, not very fleshy, tube longer than triangular marginal lobes, interior with 5 internal appendages opposite to and nearly as long as marginal lobes. Anther appendages ovate, nearly acute, scarious except for narrow midrib, higher than corona. Stigma head rounded. Fruits not seen.

Distribution. Known only from the type collection without precise locality or notes on ecology apart from the unusually high altitude, 3600 m; most likely collected in Sichuan Province.

Cynanchum longipedunculatum differs from the related *C. decipiens* C. K. Schneider by having subcapitate inflorescences up to 2 cm in diameter and coronas longer than the gynostegium. *Cynan-*

chum decipiens has umbel-like inflorescences 3–15 cm long and corona shorter than the gynostegium.

Cynanchum lysimachioides Tsiang & P. T. Li, *Acta Phytotax. Sin.* 12: 89. 1974. TYPE: China. Yunnan: between Likiang, Youngnung & Yungpei, en route to Muli, *Rock 5317* (holotype, NY; isotype, E).

Cynanchum likiangense W. T. Wang in Tsiang & P. T. Li, *Acta Phytotax. Sin.* 12: 89. 1974. Syn. nov. TYPE: China. Yunnan: Li-Kiang, 6 Aug. 1939, Y. C. Chao 21216 (holotype, KUN).

Comparison of the types of *Cynanchum lysimachioides* and *C. likiangense* shows that the supposed difference in habit, the one erect and the other twining, is not real because the habit is basically erect but with a distinct tendency toward twining. Other supposed differences in density and length of indumentum and flower size are well within the range found in many other species and seem unlikely to be of real significance.

Cynanchum megalanthum M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: 20 mi. S of Yung-ning, 2700 m, 27 May 1921, *Kingdon-Ward 4103* (holotype, E).

Species *Cynancho corymboso* similis sed ab eo corolla magna parce pubescenti, coronae lobulis marginalibus delatis tubo semper longioribus distinguenda.

Robust twining herbs. Stems puberulent along 1 (or 2) lines. Petioles ca. 2.5 cm; leaf blades triangular-ovate, ca. 8.5×4.8 cm, thinly papery, abaxially gray-green, minutely puberulent along veins, adaxially minutely puberulent, base deeply cordate, basal lobes rounded, not incurved, apex acute to acuminate; basal veins 5, lateral veins ca. 3 pairs. Inflorescences umbel-like or sometimes raceme-like with many-flowered cymules; peduncles robust, ca. 5 cm, thinly puberulent. Pedicels 10–14 mm, puberulent along 1 side. Sepals lanceolate, ca. 5×1.4 mm, sparsely and minutely puberulent. Corollas cream or pale greenish pink, deeply divided, rotate; lobes linear-lanceolate, ca. 10×2.2 mm, very sparsely hairy. Coronas cup-shaped, ca. 1 mm high, with 5 triangular marginal lobes to 3 mm high and small internal appendages. Anther appendages oval, incurved over stigma head. Fruits and seeds not seen.

Distribution and ecology. China (Yunnan Province), Myanmar. Along thicket margins; 2700 m.

Cynanchum megalanthum is superficially similar to *C. corymbosum* but with the corolla much larger and more sparsely hairy and with the corona tube

shorter than the well-defined triangular marginal lobes. The internal corona appendages are always small and sometimes more or less obsolete, suggesting a relationship also to *C. callialatum* and *C. duclouxii*, which show comparable variation.

Paratypes. CHINA. **Yunnan:** To ngay près Lou Pou préfecture de Cong tibouray, June 1906, S. Ten in *Ducloux* 4143 (P). MYANMAR. *Forrest* 10327 (E).

Cynanchum pingshanicum M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. P'ing Chan, ca. 500 km S of Beijing, mountains SW of Nan Yéli, Mei-huei-t'ouo, 5 June 1923, L. Chanet & J. H. Serre A178 (holotype, P).

Species *Cynancho acuminatifolium* Hemsley affinis sed ab eo paginis adaxialibus foliorum uniformiter puberulis, lobis corollae angustioribus, inflorescentiis longioribus differt.

Erect herbs. Stems 30–60 cm high, \pm tending to twine at tip in larger plants; internodes at first pubescent, soon glabrescent. Lower and uppermost leaves reduced, other leaves larger; petioles 1–2 cm; leaf blades ovate to elliptic, 7.5–15 \times 3.7–8.5 cm, adaxially uniformly puberulent, abaxially puberulent along veins, base cuneate to \pm truncate and decurrent along petiole; veins 5–8 pairs. Inflorescences at upper nodes, up to 4 per node, uppermost usually longer than subtending leaf, irregularly forked to \pm umbel-like, many flowered; peduncles 1–6.5 cm, glabrescent. Pedicels 6–9 mm, glabrous or sparsely puberulent. Sepals triangular-lanceolate, ca. 2 \times 0.6–0.8 mm, glabrous except for ciliate margin. Corollas probably white, ca. 12 mm diam., glabrous; lobes oblong-triangular, ca. 6 \times 2 mm, apex \pm obtuse. Coronas fleshy, 5-lobed to near base, slightly shorter than anthers; lobes bluntly triangular, \pm free from gynostegium, without internal appendages. Fruits not seen.

Cynanchum pingshanicum, which is closely related to *C. acuminatifolium* Hemsley and *C. japonicum* Morren & Decaisne, is known only from five collections all made by Chanet and Serre between 1923 and 1926. It differs from both of those species by the uniformly puberulent adaxial leaf surface, from *C. acuminatifolium* by the width of corolla lobes (2 vs. 3 mm wide), and from *C. japonicum* by the shorter inflorescences.

Paratypes. CHINA. P'ing Chan, Nan ye li, 1 June 1926, L. Chanet & J. H. Serre A724 (P); P'ing Chan, Pai lin t'ong, 4 June 1926, L. Chanet & J. H. Serre A722 (P); no data, L. Chanet & J. H. Serre 15 (P); no data, L. Chanet & J. H. Serre 1223 (P).

Cynanchum rockii M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Sichuan: Muli, Mutirong, Muti Konka, snow range E of the Yalung, 3000 m, May–June 1932, *Rock* 23718 (holotype, K; isotypes, BM, E, HUH).

Species *Cynancho vincetoxico* sensu lato affinis sed ab eo corolla atrorubenti lobis angustatis erectis glabris tubo interne lanato manifeste distinguenda.

Erect herbs. Stems 2, to 30 cm, branched, pubescent. Petioles 5–11 mm; leaf blades ovate, ca. 5 \times 3 cm, adaxially sparsely pubescent, abaxially densely puberulent along veins, base rounded to broadly cuneate, apex acuminate; lateral veins 3 or 4 pairs. Inflorescences up to 7-flowered, slender, often forked with umbel-like clusters of flowers, to 3.6 cm; peduncles ca. 1.8 cm. Pedicels ca. 6 mm. Sepals lanceolate, ca. 2.2 \times 0.5 mm. Corollas dark red, tube ca. 2 mm, lobes erect, ca. 4 \times 1.5 mm, triangular-acuminate, apex blunt, glabrous except the throat with woolly hairs. Corona lobes almost free, ovate, higher than gynostegium, apex rounded, adnate to anther, without internal appendage. Fruits not seen.

Distribution and ecology. China, Sichuan. Alpine meadow; 3000 m.

The type of *Cynanchum rockii* was cited by Tsiang (1939) as *C. muliense* Tsiang. However, the type of *C. muliense* is clearly a member of the complex including *C. vincetoxicum*, *C. inamoenum* (Maximowicz) Loesener, and *C. forrestii* Schlechter. *Cynanchum rockii* is easily distinguished by the dark red, narrowly lobed corollas, which are glabrous except for the prominently woolly throat. It also grows at a higher altitude than members of the *C. vincetoxicum* complex.

Cynanchum sinoracemosum M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Kouly Region of Pin tchouan, 1910, J. Py in F. *Ducloux* 7653 (holotype, P).

Species nova *Cynancho corymboso*, *C. wallichii*, et *C. kintungensi* similis sed ab eis internodiis uniformiter puberulis, foliis angustioribus, lobis corollarum erectis glabris differt; etiam *C. duclouxii* similis sed ab eo floribus majoribus foliis angustioribus basibus non dilatatis differt.

Twining herbs. Stems puberulent all round when young, later along 1 or 2 sides only. Petioles 1.4–3.5 cm, slender, puberulent along adaxial groove; leaf blades lanceolate, 4.3–6(–8) \times 1.5–2.5(–4.5) cm, adaxially sparsely pubescent, abaxially paler and more sparsely hairy, sometimes \pm glabrous except for veins, base deeply cordate, basal lobes incurved and sometimes overlapping, apex long acute to

slightly acuminate; basal veins 5–7, lateral veins 3 or 4 pairs; minute stipule-like axillary leaves present. Inflorescences raceme-like, 2–4 cm, cymules 2-flowered, in regular spiral; peduncles 0.4–2.5 cm, puberulent. Pedicels 3–7 mm. Sepals ca. 1.3×0.7 mm, puberulent. Corollas white, erect, glabrous; lobes oblong-lanceolate, $3.3\text{--}4.5 \times 1.3\text{--}1.5$ mm. Coronas white, deeply cup-shaped, 2–3 mm high, concealing gynostegium, plicate, marginal lobes 5, \pm bluntly triangular, to 0.4 mm, alternating with well-defined, \pm appendage-like plicae. Anther appendages lanceolate, erect, white. Fruits not seen.

Distribution. China, Sichuan and Yunnan Provinces. Growing in hedges, at least at 1900 m.

Cynanchum sinoracemosum resembles *C. duclouxii* in having erect glabrous corollas and reduced corona appendages. *Cynanchum duclouxii* has distinctly smaller flowers with corona appendages reduced to paired gibbosities, whereas *C. sinoracemosum* has prominent longitudinal plicae and broader leaves often with enlarged basal lobes. Other species with similar coronas and inflorescences (e.g., *C. callialatum*, *C. corymbosum* Wight, *C. kintungense*, and *C. wallichii*) differ by their spreading to reflexed, mostly hairy, corollas and broader leaves. In all these closely related species the internodes have the hairs restricted to one or two narrow lines, but in *C. sinoracemosum* the internodes are uniformly hairy when young and do not develop the well-defined lines of hairs when glabrescent.

Paratypes. CHINA. **Sichuan:** Kouy Tchéou, June 1914, J. Esquirol 5037 (P); Kouy Tchéou, near Ganpin, 29 Aug. 1897, E. Bodinier & L. Martin 1958 (P). **Yunnan:** Yo lin chan, near Tong miy tcheou, 1911, F. Ducloux (P); near Ou se tchong, 1 Aug. 1904, J. Tén in F. Ducloux 2904 (P); Yunnan Fu, 1900 m, 30 July 1916, Schoch 255 (US).

Cynanchum triangulare M. G. Gilbert, W. D. Stevens & P. T. Li, nom. nov. Replaced name: *Cynanchum deltoideum* J. D. Hooker, Fl. Brit. India 4: 24. 1883, not *Cynanchum deltoideum* Hance, Ann. Sci. Nat., sér. 5. 5: 228. 1866. *Vincetoxicum deltoideum* ["deltodeum"] O. Kuntze, Rev. Gen. 2: 424. 1891. TYPE: India. Khasia Mts.: Kalapanee and Moflong, 5000–6000 ft., Hooker & Thomson s.n. (holotype, K; isotype, P).

Cynanchum triangulare has usually been dismissed (e.g., Tsiang & Li, 1977) as a synonym of *C. otophyllum* C. K. Schneider, but it differs from that by the much better developed corona tube and appears to be a good species restricted to north-

western India. This leaves *C. otophyllum* as a Chinese endemic.

Heterostemma Wight & Arnott.

Heterostemma has about 30 species distributed from India east through the tropics to northern Australia and Samoa. It is represented in China by nine species, of which four are endemic.

Heterostemma menghaiense (H. Zhu & H. Wang) M. G. Gilbert & P. T. Li, comb. et stat. nov. Basionym: *Heterostemma villosum* Costantin var. *menghaiense* H. Zhu & H. Wang, Acta Bot. Yunnan. 16: 27, fig. 2. 1994. TYPE: China. Yunnan: Xishuangbanna, Menghai, Mengsong, 1000 m, 14 May 1989, Zhu H. & Wang H. 2443 (holotype, HITBC not seen).

Heterostemma menghaiense was first collected in 1938 by T. T. Yü (Yü 16307), and it is strange that it remained undescribed for so many years. It has possibly been confused with the Indochinese *H. villosum* Costantin, which has a much less distinctive indumentum. The uniformly densely long pilose indumentum is not matched by any other member of *Heterostemma*. Several species have lines of similar long hairs along the internodes, but the hairs on the leaves and flowers of these other species are always much finer and sparser than in *H. menghaiense* and are often appressed. The large flowers of *H. menghaiense* are also distinctive, matched best by those of *H. grandiflorum* Costantin.

Second collection. CHINA. **Yunnan:** Shunning, T. T. Yü 16307 (A, E).

Hoya R. Brown.

Hoya is a genus of perhaps 100 species distributed primarily in southeastern Asia into Oceania. Seventeen of the 32 Chinese species are endemic.

Hoya chinghungensis (Tsiang & P. T. Li) M. G. Gilbert, P. T. Li & W. D. Stevens, comb. nov. Basionym: *Dischidia chinghungensis* Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 130. 1974. TYPE: China. Yunnan: Che-li Hsien, Mengsoong, Dah-Meng-Lung, 1900 m, Sep. 1936, C. W. Wang 78311 (holotype, IBSC; isotype, A).

The collections cited in the protologue of *Dischidia chinghungensis* are all in fruit, and flowers were not known to the original authors. Flowering collections are now available, and it is obvious that this is a species of *Hoya* closely allied to *H. lan-*

ceolata D. Don. Material of *H. chinghungensis* collected in Thailand (at Tee-Lao-Su waterfall, Mae Sod District, Tak Province, near the border with Myanmar), which was not seen by us, along with a good color photo on the cover, were discussed by Thorut (1993) as "*Hoya bella* subsp. nov." However, Thorut failed to make the connection with *D. chinghungensis*, even though he cited all the Chinese collections in the protologue of that species. There may well be a case for treating this and *H. bella* W. J. Hooker as subspecies of *H. lanceolata*, but this should only be done after a detailed study of the complex as a whole, which is otherwise entirely extra-Chinese.

Material seen. CHINA. **Yunnan:** Jinghong Xian, 1700 m, 5 June 1992, *Tsi Zhanhuo* 92-362 (MO). MYANMAR. Northern Triangle, *Kingdon-Ward* 21152 (E).

Hoya commutata M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Guangxi: Shap Man Taai Shan, near Iu Shan village, SE of Shang-sze, near border with Guangdong, *W. T. Tsang* 22375 (holotype, P, mixed with *H. fusca*).

Species nova a congeneris ramis floriferis dense pubescentibus foliis caducis, floribus purpureis, lobulis corollae acutis gracilibus sinus corollae excedentibus distinguenda.

Habit not known, possibly a hanging epiphyte. Stems pubescent. Leaves not known. Inflorescences pubescent, ca. 30-flowered; peduncles ca. 2 cm. Pedicels to 4 cm, slender, flexuous in dried specimens. Sepals triangular, ca. 2.5×0.9 – 1.3 mm, densely pubescent. Corollas rotate with revolute margins, "purple," ca. 1.5 cm diam., densely papillate-pubescent, limb ca. 0.8 cm wide. Corona lobes acute, stellately spreading, extending beyond sinus between corolla lobes; inner margins acute, \pm meeting in center. Fruits not seen.

The only piece of *Hoya commutata* seen from China is a bare twig with a single inflorescence included with a collection of *H. fusca*. Other sheets of *Tsang* 22375 have only young fruiting material of *H. fusca*. The two taxa can easily be separated by the fact that *H. commutata* is more or less uniformly pubescent, while *H. fusca* is glabrous.

The paratype is very similar to the holotype, again a bare stem with leaves from another plant, this time belonging to *Alstonia* (Apocynaceae). It differs from the holotype only by the sparser indumentum. The inflorescence and the long corona lobes, which extend beyond the sinuses between corolla lobes, are very similar indeed, though there is no note on the color. It would seem that *Hoya commutata* flowers on rather specialized hanging branches with cadu-

cous leaves, most unusual in a genus normally noted for its long-lived leaves.

Paratype. MYANMAR. Northern Triangle, *Kingdon-Ward* 21276 (BM).

Hoya mekongensis M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Xizang/Yunnan: Tsékou (Haut Mékong), 10 Oct. 1895, *Biet in Soulié* 1598 (holotype, P; isotypes, P 2 sheets).

Species nova *Hoyae lii* Burton similis sed ab ea ramulis petiolisque non setosis inflorescentiis lateralibus differt.

Lianas climbing by adventitious roots. Stems minutely puberulent, glabrescent. Petioles 1.2–1.6 cm, minutely puberulent; leaf blades oblong-ob lanceolate, 10 – 13×4 – 5 cm, minutely hairy, base rounded, apex acuminate to caudate-acuminate; lateral veins ca. 7, poorly defined. Pseudumbels extra-axillary, apparently flat topped, at least 8-flowered; peduncles (0.3–)1–2.5 cm, pubescent. Pedicels 2–2.7 cm, sparsely hairy on 1 side. Sepals ovate, ca. 1.5×1.5 mm, sparsely hairy. Corollas white, sweet scented, 1.5–1.7 cm diam., reflexed, lobes ca. 6×5 mm, minutely papillate with short-ciliate margins. Corona lobes \pm ovoid, erect, ca. 2 times as high as gynostegium, dorsal grooves very narrow, inner tooth incumbent on gynostegium, just meeting in center. Anther margins short; appendages inconspicuous. Fruits not seen.

Hoya mekongensis appears to be most closely related to *H. lii* Burton, which has a similar reflexed corolla and erect, rounded corona lobes. It differs by having minutely puberulent stems and petioles and extra-axillary inflorescences. In contrast, *H. lii* has setose stems and petioles and terminal inflorescences.

***Jasminanthes* Blume.**

We believe that the genus *Stephanotis* is best treated as a Malagasy endemic. Therefore, the following new combinations are needed for the *Flora of China*.

Jasminanthes chunii (Tsiang) W. D. Stevens & P. T. Li, comb. nov. Basionym: *Stephanotis chunii* Tsiang, *Sunyatsenia* 3: 165. 1936. TYPE: China. Guangdong: Tung-Wu Shan, 6 May 1928, *W. T. Chun* 6417 (holotype, IBSC, originally in SYS).

Jasminanthes mucronata (Blanco) W. D. Stevens & P. T. Li, comb. nov. Basionym: *Apocynum mucronatum* Blanco, *Fl. Filip.* 852. 1837. TYPE: from seed sent from China (holotype, not preserved; see Merrill, 1918).

Jasminanthes pilosa (Kerr) W. D. Stevens & P. T. Li, comb. nov. Basionym: *Stephanotis pilosa* Kerr, Bull. Misc. Inform. 1938: 453. 1938. TYPE: Thailand. Loi, Dan Sai, Kao Keo Kang, 1300 m, Kerr 5769 (holotype, K).

Jasminanthes saxatilis (Tsiang & P. T. Li) W. D. Stevens & P. T. Li, comb. nov. Basionym: *Stephanotis saxatilis* Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 118. 1974. TYPE: China. Yunnan: Foo-Ning, 1100 m, 3 May 1940, C. W. Wang 89139 (holotype, KUN).

Lygisma J. D. Hooker.

A genus of 3(–6) species known from Malaysia, Myanmar, Thailand, Vietnam, and China. One species in China.

Lygisma inflexum (Costantin) Kerr, Bull. Misc. Inform. Kew 1939: 457. 1939. Basionym: *Pilostigma inflexum* Costantin in Lecomte, Fl. Indo-Chine 4: 73. 1912. TYPE: Vietnam. Cochinchine, Thorel s.n. (holotype, P).

Tylophora hainanensis Tsiang & P. T. Li, Acta Phytotax. Sin. 10: 35. 1965. Syn. nov. TYPE: China. Hainan: Po-Ting, 120 m, 1 Oct. 1957, H. D. Zhang 948 (holotype, HC-HSNU).

Lygisma is easily recognized by the small flowers with very characteristic inflexed corolla lobes. The correct generic position of the Chinese material had been questioned since it was first collected. It was placed in *Tylophora*, but with reservation. The type of *T. hainanensis* is a very good match with the type of *Lygisma inflexum*.

Marsdenia R. Brown.

Marsdenia includes about 100 species distributed in America, Asia, and tropical Africa. Of the 25 native species in China, 14 are endemic.

Marsdenia brachyloba M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Feng Chen Lin Mountain, A. Henry 11196 (holotype, K).

Species nova a speciebus aliis inflorescentiis umbelliformibus, corolla purpurea, lobulis coronarum brevibus lateraliter compressis basibus profunde sulcatis distinguenda.

Lianas, glabrous except for sepal and corolla margins. Nodes with distinct interpetiolar line. Petioles 2.5–4.5 cm; leaf blades elliptic, 10–14.5 × 5–7.5 cm, abaxially very pale, adaxially dark with paler

zone along midrib, base cuneate, apex acuminate; lateral veins 5 or 6 pairs, raised on both sides. Inflorescences umbel-like, up to 20-flowered; peduncles to 3 cm. Pedicels 1–1.7 cm. Sepals ± circular, ca. 1.5 × 1.5 mm, margin ciliolate. Corollas bell-shaped with spreading lobes, purple; tube ca. 2 mm, broader than long; lobes ca. 4 × 2 mm, apex rounded. Corona lobes ca. as high as anthers, laterally compressed with almost hooked tip, basal half deeply grooved. Anther appendages oblong, rather fleshy toward base, half as high as stigma head. Stigma head ovoid with acuminate, divided beak, exserted from corolla tube. Follicles solitary, lanceolate in outline, ca. 16 × 4 cm, base narrowed into a stalk 1 cm long. Seeds ovate, ca. 17 × 7 mm; coma off-white, to 3 cm.

Because of its somewhat reduced corona lobes, material of *Marsdenia brachyloba* has usually been filed under *Gongronema*. Each corona lobe is closely appressed to the anther in the form of an inverted “V” with the apex laterally compressed and somewhat recurved and the lower part deeply grooved, with the two legs of the “V” slightly spreading and almost winglike. This contrasts very strongly with the short, spreading, dorsiventrally compressed scales inserted at the bases of the anthers that characterize *Gongronema*. The conspicuously exserted stigma head of *M. brachyloba* is also similar to that of many other species of *Marsdenia* in the narrow sense.

Paratype. CHINA. Yunnan: Feng Chen Lin Mountain, A. Henry 11073 (K).

Marsdenia tenii M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Siu tchoang, Sim-eon Tén 395 (holotype, E).

Species nova *Marsdeniae hainanensi* Tsiang similis sed ab ea lamina foliari basi rotundata vel truncata, inflorescentiis longis simplicibus cymulos umbelliformes gerentibus differt.

Lianas, yellow-brown tomentose except for flowers. Petioles to 4 cm; leaf blades oblong-ovate, to 12.5 × 7.5 cm, sparsely hairy, base rounded to truncate, apex acute; lateral veins ca. 5 pairs. Inflorescences with several umbel-like cymules along an unbranched rachis; peduncles to 3 cm; rachis to at least 2 cm. Pedicels ca. 5 mm. Sepals elliptic, ca. 3 × 2 cm. Corollas white, rotate, ca. 6 mm, glabrous except for lobes and retrorsely pilose throat; lobes ca. 3.5 × 2.5 mm, densely appressed-tomentose in center. Corona lobes to base of anthers, almost flat. Stigma head bifid-conical, equaling anther appendages. Fruits not seen.

Marsdenia tenii is similar to *M. hainanensis*, *M. tomentosa* Morren & Decaisne, and *M. sinensis* Hemsley, with which it shares ovate tomentose leaves. It is easily separated from these by the inflorescence, which has a long, unbranched rachis. The other species have much-branched inflorescences that are often wider than long.

Marsdenia tinctoria R. Brown, Mem. Wern. Soc. 1: 28. 1810. TYPE: Indonesia. Sumatra: "Tar-am akkar Mars. Sumat. 78" (holotype, BM).

Marsdenia globifera Tsiang, Sunyatsenia 3: 199. 1936. Syn. nov. TYPE: China. Kwangtung: Yung Yuen, S. K. Lau 24527 (isotype, P).

Marsdenia tinctoria var. *brevis* Costantin in Lecomte, Fl. Indo-Chine 4: 94. 1912. Syn. nov. SYNTYPES: Laos, Phon-thane, *Spire s.n.* (P); Pon-pissay, *Thorel s.n.* (P).

At first glance, the flowers of *Marsdenia globifera* are very distinct, and it is difficult to compare them with those of any other species. However, the stems and leaves are so similar to those of the common and widespread *M. tinctoria* that the two plants have to be closely related. A closer examination revealed that the flowers of *M. globifera* are diseased, and their lower part is an undifferentiated solid tissue. This is hinted at by the drawing of a longitudinal section of a flower in the protologue. Therefore, we have no hesitation in including this diseased material in *M. tinctoria*.

Marsdenia yuei M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Mienning, Taheching, 2300 m, T. T. Yü 17801 (holotype, E).

Species nova *Marsdeniae koi* Tsiang similis, sed ab ea pedunculis brevioribus, corollis glabris parvilobis, lobulis coronae tubo corollae longioribus differt.

Lianas, glabrous except for flowers. Stems stout. Petioles 4 cm; leaf blades ovate, ca. 9.5×5.8 cm, base shallowly cordate, apex bluntly cuspidate to shortly acuminate, lateral veins 4 or 5 pairs, flattened. Inflorescences umbel-like, up to 9-flowered; peduncles ca. 15 mm. Pedicels to 9 mm. Sepals rounded, ca. 3×2.5 mm, finely appressed puberulent. Corollas white, \pm campanulate, glabrous except for sparsely ciliate margins; tube ca. $4.5-5 \times 4$ mm; lobes oblong-obovate, ca. $5.5 \times 2.5-3.2$ mm, apex rounded. Gynostegium ca. 6 mm high. Corona lobes narrowly triangular, as long as anther appendages, apex rounded, exserted from corolla tube. Anther appendages ovate, membranous margin relatively narrow. Stigma head hemispherical, conspicuously exserted from anther appendages and corolla tube. Fruits not seen.

We take pleasure in dedicating *Marsdenia yuei* to the collector, one of the most highly regarded of all Chinese plant taxonomists. The type collection was cited as *M. medogensis* P. T. Li in the protologue of that species, which has much larger flowers with corolla lobes ca. 9×9 mm, discoid stigma head only slightly exserted from the anther appendages, and oblong leaf blades more than four times as long as broad with rounded base and acute apex. Vegetatively *M. yuei* seems more closely related to *M. koi* Merrill than to *M. medogensis*. *Marsdenia koi* has much longer pedicels, larger flowers, and corona lobes shorter than the anthers and corolla tube.

Merrillanthus Chun & Tsiang.

The original account of this monotypic genus described the pollinia as pendulous, which would make it a member of the Asclepiadeae. The general morphology, especially the form of the corona lobes, suggested that this might not be correct, but most material available had flowers too poorly preserved to check the pollinia. An isoparatype sheet, Lau 3550 (P), has flowers well enough preserved to examine the corona in more detail. This proved to be extremely *Tylophora*-like in all respects, including the horizontal pollinia. *Tylophora augustiniana* (Hemsley) Craib is particularly similar, differing only by the much smaller flowers. *Merrillanthus* can be easily separated from known species of *Tylophora* by the large fruit with a thick fibrous mesocarp, in contrast to the very thin, often almost papery follicle walls of all species of *Tylophora* familiar to us. Thus *Merrillanthus* is kept, at least until *Tylophora* as a whole is revised. However, the fruits of *T. augustiniana* have not been described, and *Marsdenia*, even in the narrow sense adopted for the *Flora of China*, shows a comparable range of fruit types. A collection from Cambodia, *M. A. Martin* 310 (P), is almost certainly *M. hainanensis*, which would mean that *Merrillanthus* is no longer endemic to China.

Sichuania alterniloba M. G. Gilbert & P. T. Li, gen. et sp. nov. TYPE: China. Sichuan: S Wushan, A. Henry 7262 (holotype, E).

Genus et species nova *Holostemma* R. Brown similis sed ab eo inflorescentiis racemiformibus, floribus minoribus, lobulis coronae liberis et antheris alternantibus, antheris pallidis lucentibus marginibus longis dorsaliter sulcatis appendicibus prominentibus scariis manifeste differt.

Robust twining herbs. Stems minutely puberulent along 1 side (sometimes along 2 at base of internode).

Petioles 2–3 cm; leaf blades ovate-triangular, 5–8 × 3.3–7 cm, abaxially pale, adaxially much darker and apparently glossy, base cordate, thick, glabrous throughout; lateral veins 4–6 pairs. Inflorescences raceme-like, with few-flowered cymes arranged in lax spiral along rachis; peduncles 1.5–5.5 cm, sometimes sharply reflexed; rachis up to 2 cm; bracteoles few, ca. 1 mm. Pedicels up to 1 cm, puberulent along 1 side. Sepals lanceolate, ca. 2.7 × 1.3 mm, apex acute, almost glabrous. Corollas very shallowly bowl-shaped, almost rotate, white, glabrous; lobes ovate, ca. 5.5 × 3.5 mm. Corona lobes separate, alternating with anthers, ovate to ± semicircular, short and inconspicuous. Gynostegium ca. 2.5 mm high; anthers ca. 2 mm, uniformly pale and glossy with long margins and dorsal groove; anther appendages ovate, scarious except for narrow midrib. Retinaculum ca. 0.5 mm; translator arms short and rigid; pollinia cylindrical-ovoid, slightly compressed, ca. 0.6 mm. Stigma head apiculate, concealed by anther appendages. Fruits not seen.

Distribution. Endemic to China, Sichuan Province (South Wushan and Tianquan Xian).

The generic position of *Sichuania alterniloba* is so questionable that it seems best to place it in a genus of its own. The original collection had been named as *Holostemma*, a view supported by the presence of an interpetiolar line, fairly large, hard-textured anthers more or less decurrent at the base to the corolla, pendent pollinia, and fairly thin-textured corona. However, the distinctive corona with separate, spreading, ovate scalelike lobes alternating with the anthers (i.e., opposite the corolla lobes) is quite different from the annular corona of *Holostemma* and from that of any other genus known to us. Other genera such as *Gongronema* have free, scalelike corona lobes inserted at the base of the gynostegium. In all taxa with similar scalelike lobes known to us, these are opposite the anthers. *Roulinia parviflora* Decaisne (*Cynanchum contrapetalum* E. Sundell; see Sundell, 1981) is described as having corona lobes opposite the corolla lobes, but these are erect and grooved. *Cynanchum contrapetalum* is apparently in all other ways typical of *Cynanchum* subg. *Mellichampia* and thus is unrelated to *Sichuania*. The anther form of *Sichuania* is also different from that of *Holostemma* in that the anther tips are more or less retuse with very sharply delineated scarious appendages, not acuminate with poorly differentiated inconspicuous appendages.

Paratype. CHINA. **Sichuan:** Tianquan Xian, 1000 m, 11 Sep. 1963, *West of Sichuan Expedition Group* 3334 (HNWP).

Tylophora R. Brown.

Tylophora is in need of an overall revision. Most African material has never been named. The distinction from allied genera such as *Belostemma* Wallich ex Wight, *Merrillanthus*, and *Pentastelma* Tsiang & P. T. Li needs closer investigation. Some of the species from tropical Asia look very different from typical members of the genus and equally deserve investigation.

The separation between *Cynanchum* and *Tylophora* on floral morphology is sometimes difficult. It is often hard to interpret the orientation of the pollinia in the smaller-flowered asclepiads with only slightly elongated pollinia, especially in dried material. In most cases the characteristic erect corona lobes clearly inserted on the anthers of most species of *Tylophora* is diagnostic. However, there are some species, such as *T. glabra* Costantin, otherwise typical of the genus, in which the corona lobes are almost free from the anthers, spreading and laterally joined at the base to form a very *Cynanchum*-like structure. Several non-floral characters often enable the confident recognition of virtually all species of *Tylophora*, at least in mainland Asia. These include often elongated, zigzag, inflorescence rachises, widely spaced cymules frequently elongated with age, very narrow bracts, threadlike pedicels, and often paired, widely divaricate fruits. None of these characters is of itself diagnostic, but in combination they form a distinctive facies that leaves little doubt in the recognition of *Tylophora*.

Tylophora costantiniana (Tsiang) M. G. Gilbert, W. D. Stevens & P. T. Li, comb. nov. Basionym: *Cynanchum costantinianum* Tsiang, *Sunyatsenia* 4: 119. 1939, new name for *Cynanchum hirsutum* Costantin, in Lecomte, *Fl. Gen. Indo-Chine* 4: 66, fig. 10 (12–13). 1912, not *C. hirsutum* Vahl, *Eclog. Amer.* 2: 24. 1798, nor *Tylophora hirsuta* (Wallich) Wight, *Contr. Bot. India* 49. 1834. TYPE: Vietnam. Tonkin, Mekong, *Thorel s.n.* (holotype, P).

The type material of *Cynanchum hirsutum* Costantin is mostly in fruit. However, one stem has an inflorescence with buds developed sufficiently to confirm that this is a *Tylophora* closely related to *T. tsiangii*.

Tylophora forrestii M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: hills NW of Tiugyueh(?) (25°30'N, 98°25'E), 2100 m, May 1931, *Forrest* 29601 (holotype, E).

Species *Tylophorae ovatae* (Lindley) Hooker ex Steudel similis sed ab ea internodiis glabrescentibus, foliis membranaceis, inflorescentiis longioribus cymulas umbelliformes gerentibus, floribus majoribus differt; a *T. brownii* foliis membranaceis basi cuneatis vel rotundatis differt.

Lianas. Stems uniformly pubescent when young but glabrescent and soon glabrous or pubescent along 1 side only. Petioles to 2 cm; leaf blades ovate-elliptic, to 9.4×4.2 cm, membranous, base broadly cuneate to \pm rounded, apex acuminate; lateral veins 4 or 5 pairs, prominently pilose when young, glabrescent. Cymes to 8 cm; peduncles to 4.5 cm, pubescent, cymules \pm umbel-like, ca. 6-flowered; bracts linear, ca. 1.5 mm. Pedicels to 15 mm. Sepals linear-lanceolate, ca. 3×0.4 mm, apex acute, margins prominently ciliate. Corollas yellow-green, tube ca. 0.7 mm, lobes ca. 6×1.6 mm wide, glabrous. Corona lobes narrowly ovoid, appressed to gynostegium and reaching base of anthers, \pm acute. Gynostegium ca. 2 mm high; anther appendages ovate, erect. Corpusculum longer than ellipsoid pollinia. Fruits not seen.

The indumentum suggests an affinity to *Tylophora ovata*, but *T. forrestii* is a more vigorous plant with softer leaves, larger flowers, more strictly umbel-like cymules, and readily glabrescent stems.

Tylophora glabra Costantin in Lecomte, Fl. Indo-Chine 4: 109. 1912. TYPES: Vietnam. Tonkin vers Ninh-Binh, *Bon s.n.* (syntype, P); vers Ouonbi, au nord de Guang-yen, *Balansa 609* (syntypes, P, K); Sept Pagodes, *Mouret s.n.* (syntype, P).

Tylophora longipedicellata Tsiang & P. T. Li, Act. Phytotax. Sin. 12: 136. 1974. Syn. nov. TYPE: China. Hainan: Lung-Kiang, 15 Sep. 1933, C. H. Tsoong 545 (holotype, IBSC).

Tylophora renchangii Tsiang, Sunyatsenia 3: 232. 1936. Syn. nov. TYPE: China. Guangxi ("Kwangsi"): Tien-chen, N of Sup-man-ta Shan, 900 m, 13 Oct. 1928, R. C. Ching 7821 (holotype, IBSC; isotype, A).

Tsiang (1936) first drew attention to the unusual corona of this species in his protologue for *Tylophora renchangii*. The corona lobes are almost *Heterostemma*-like and distinct from any other *Tylophora* seen from mainland Asia. Typical *Tylophora* corona lobes are closely appressed to the stamens, dorsally gibbous, and have an acuminate tip. In *T. glabra* the corona lobes are more or less circular, inserted at the base of the anthers, and spread at an angle of about 45° to them, while the acuminate tip is often strongly reflexed. Superficially these are so different that it is difficult to accept

this species in *Tylophora*, but all other features of *T. glabra* are typical of that genus.

The status of *Tylophora longipedicellata* deserves more investigation. Most material from Hainan has the broad spreading corona lobes with a blunt inflexed tip characteristic of *T. glabra*. Other collections have short erect corona lobes with an erect acuminate tip, as illustrated in the protologue of *T. longipedicellata*. In other features, the two species are nearly identical. Henry 8275 (K) has corona lobes somewhat intermediate between those of the two species. Therefore, we tentatively reduce *T. longipedicellata* to synonymy of *T. glabra*.

Tylophora oligophylla (Tsiang) M. G. Gilbert, W. D. Stevens & P. T. Li, comb. nov. Basionym: *Absolmsia oligophylla* Tsiang, Sunyatsenia 6: 121. 1941. TYPE: China. Yunnan: Che-li Hsien, Aug. 1936, C. W. Wang 75455 (holotype not seen; isotype, PE).

The generic placement of *Absolmsia oligophylla* is uncertain. It differs profoundly from the type and only other species of *Absolmsia*, *A. spartioides* (Benth) Kuntze, which is a very specialized relative of *Hoya*, known only from rot holes in large trees in Borneo. *Absolmsia spartioides* has fleshy leaves when young but then depends on persistent, long, stiff, photosynthetic peduncles, which seem to take over the function of leaves. A sheet labeled in Tsiang's handwriting as the holotype of *A. oligophylla*, deposited in the herbarium of the Fan Memorial Institute of Biology and now housed in the Institute of Systematic Botany, Beijing (PE), consists of the lower part of a single stem and completely lacks any trace of inflorescences and flowers. A photograph of a different sheet showing the upper parts was reproduced in the protologue. A search for an isotype at the South China Institute of Botany was not successful. The material seen appears to come from a prostrate plant with no sign of the stem's twining and with soil adhering to the undersides of the leaves, very like *Tylophora rotundifolia* Hamilton ex Wight, which also has similar almost circular leaves. The illustration of the flowers accompanying the protologue, particularly the small gynostegium, is also suggestive of a *Tylophora*. The spreading corona lobes would be unusual for *Tylophora*, but *T. glabra* Costantin has even larger spreading lobes that are at least superficially similar. The description of pollinia as pendulous, if correct, would rule out a placement in *Tylophora*, but, as discussed above, *Merrillanthus* was described as having pendulous pollinia whereas examination of material cited in the protologue showed the pollinia

to be horizontal. The large, stiffly papery leaves and indumentum of short stiff hairs of *T. oligophylla* are distinctive, and it should be easy to make a positive match with new material, should this become available.

Tylophora rockii M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Sichuan: Muti Konka, 3300 m, *Rock* 23717 (holotype, E).

Species nova *Tylophorae yunnanensi* Schlechter similis sed ab ea inflorescentiis sessilibus, floribus majoribus, capite stigmatico elevato differt.

Erect herbs to 70 cm. Stems little branched, tending to twine at tips, uniformly puberulent. Petioles ca. 15 mm; leaf blades oblong-ob lanceolate, to 9.5×4 cm, sparsely puberulent, uppermost and lowermost reduced, base cuneate to \pm rounded, apex rounded-apiculate, margins \pm undulate, veins 4 or 5 pairs. Inflorescences extra-axillary from upper nodes, to 8 cm, mostly \pm sessile with long first internode, cymules shortly and densely raceme-like to umbel-like. Pedicels to 1(-2) cm. Sepals linear-triangular, ca. 3 mm. Corollas purplish, stiffly rotate, 8-10 mm diam.; lobes oblong, $5(-7) \times 2.5-3$ mm, apex rounded; interior densely puberulent. Corona lobes reaching base of anther appendage, \pm acute. Gynostegium ca. 1.5 mm high; anther appendages broader than long. Stigma head broadly dome-shaped with light-colored center. Fruits not seen.

Tylophora rockii is most closely related to *T. yunnanensis*, which has distinctly smaller flowers, sepals ca. 1.5 mm long, and corolla lobes $3-4 \times 1.5-2$ mm. *Tylophora rockii* has mainly sessile inflorescences with long first internodes, whereas *T. yunnanensis* has peduncles to 6 cm long. *Tylophora rockii* has a broadly dome-shaped stigma head in contrast to the depressed stigma head of *T. yunnanensis*.

Tylophora tsiangii (P. T. Li) M. G. Gilbert, W. D. Stevens & P. T. Li, comb. nov. Basionym: *Cynanchum tsiangii* P. T. Li, Bull. Bot. Lab. North-E. Forest. Inst. 3(1): 103. 1983. TYPE: China. Guizhou: Xing-yi, 1300 m, 7 Oct. 1960, Y. T. Chang et al. 6880 (holotype, SCBI).

The hispid indumentum, brownish coloring of the dried leaves, and inflorescence architecture (a long zigzag rachis with elongated raceme-like cymules and linear bracts) of *Tylophora tsiangii* are all very similar to those of *Tylophora ovata* (Lindley) Hooker ex Steudel. The short, elliptic corona lobes adnate to and clearly shorter than the anthers are typical for *Tylophora*. Though placed in different parts of

the family, the distinction in floral morphology between these two genera can be very subtle. *Tylophora tsiangii* is clearly related to the Indochinese *T. costantiniana*, which is very similar in habit and was also misplaced within *Cynanchum*.

Tylophora tuberculata M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Yunnan: Kouy-Tcheou, Echâng loing, 800 m, May 1913, *Esquirol* 4377A (holotype, P, mixed with *Cynanchum corymbosum* Wight).

Species nova *Tylophorae tenui* Blume similis sed ab ea et speciebus similibus caulium indumento ex trichomatibus erectis crassisque constante, foliis adaxialiter tuberculatis, lobulis coronae basaliter connatis, dorsaliter dilatatis umbonem subpatentem truncatum vel leviter emarginatum formantibus manifeste distinguenda.

Lianas. Stems slender, short pilose along 2 sides. Petioles 5-10 mm, adaxially hairy, glabrescent; leaf blades lanceolate, $2.5-4 \times 1.1-1.2$ cm, thick papery, base rounded-cordate, apex acute, glabrous, adaxially with prominent scattered tubercles. Inflorescences to 4 cm, much branched; peduncles to 6 mm, internodes to 14 mm. Pedicels 4-6 mm, glabrous. Sepals lanceolate, ca. 0.7 mm, tip recurved, acute, glabrous. Corollas rotate to shallowly bowl-shaped, ca. 5 mm diam., greenish white, glabrous outside, densely short pilose inside; lobes ovate, ca. 2×1.5 mm. Corona lobes joined at base, reaching base of anther, with very prominent spreading, truncate or slightly emarginate, dorsal projection. Anther appendages short, rounded; pollinia ellipsoid, almost vertical. Stigma head rounded. Old follicles linear lanceolate in outline, ca. 6.5×0.5 cm.

Tylophora tuberculata resembles *T. tenuis* Blume in having small lanceolate leaves and delicate much-branched inflorescences. It differs from that and all similar species of *Tylophora* by the thick stiffly erect hairs forming two lines down the internodes of young stems and along the margins of the petioles, the well-defined small tubercles scattered adaxially on leaf blades, the inflorescence with the peduncle clearly shorter than the internodes of the branched rachis, and the distinctive corona lobes, which are enlarged dorsally into a more or less spreading, fleshy, truncate to slightly emarginate projection and joined laterally at the base by a thin flange. The corona can be interpreted as forming a link between the corona lobes of typical species of *Tylophora*, in which the lobes are only slightly swollen dorsally, and the corona lobes of *T. glabra*, in which the dorsal swelling seems to be grossly expanded into a flat disc. The only sheet seen also has a fruit of *Cynanchum corymbosum* Wight mounted on it.

Tylophora uncinata M. G. Gilbert & P. T. Li, sp. nov. TYPE: China. Hainan: Po-ting, *How* 73159 (holotype, IBSC; isotypes, A, IBSC).

Species nova *Tylophorae ovatae* (Lindley) Hooker ex Steudel affinis sed ab ea lamina foliari adaxialiter glabra abaxialiter trichomatibus apice uncinatis basi papillosis manifeste differt.

Lianas. Stems glabrescent. Petioles ca. 1.5 cm; leaf blades ovate, 3.5–9 × 1.3–5.5 cm, stiffly papery, adaxially glabrous, abaxially uniformly pubescent, hairs with papillate bases and strongly hooked tips, base cordate, sinus usually deep and narrow, apex ± acute, apiculate. Cyme extra-axillary; peduncles to 2 cm, rachis zigzag, sometimes ± absent, cymules densely raceme-like; bracts linear-lanceolate, to 1.5 mm. Pedicels 6–8 mm. Sepals ca. 1.7 × 0.5–0.7 mm, oblong-lanceolate, apex acute, with few to many hooked hairs. Corolla pale green at apex, dull green at base, 3.5–5 mm; tube ca. 0.5 mm; lobes ovate to ovate-oblong, 2.5–3.5 × 1.2–1.3 mm. Corona lobes ovate, ca. 0.5 × 0.2 mm, pouched, apex obtuse, covering base of anthers. Anther appendage rounded; pollinia globose, horizontal. Stigma head ± flat, 5-angled, depressed in center. Follicles linear-lanceolate in outline, ca. 5 × 0.6 cm, apex acuminate. Flowering August–September.

Tylophora uncinata had been named mostly as *T. ovata* (Lindley) Hooker ex Steudel var. *brownii* (Hayata) Tsiang & P. T. Li, but closer examination has shown that it differs from all species of *Tylophora* known to us by the very distinctive hooked

hairs on the underside of the leaves. *Tylophora uncinata* differs further from otherwise similar species such as *T. ovata* by the more papery, adaxially glabrous leaves.

Paratypes. CHINA. **Guangdong**: Gao-zhou, 4 Apr. 1929, Y. Tsiang 2088B (IBSC). **Guangxi**: Shang-si, 2 Aug. 1951, W. C. Ko 901 (CANT); without locality, Nov. 1889, A. Henry 8105 (K, P).

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Literature Cited

- Merrill, E. D. 1918. Species Blancoanae. Publ. Dept. Agric. Nat. Resour. Manila 12: 1–423.
 Sundell, E. 1981. The New World species of *Cynanchum*, subgen. *Mellichampia* (Asclepiadaceae). Evol. Monogr. 5: 1–63.
 Thorut, C. 1993. A very special *Hoya*. The Hoya 15: 29–30.
 Tsiang, Y. 1936. Notes on the Asiatic Apocynales III. Sunyatsenia 3: 121–239.
 ———. 1939. An enumeration of the Asclepiadaceae plants collected by Tsai and Wang from Yunnan in 1933–1936. Sunyatsenia 4: 95–130.
 ——— & P.-T. Li. 1977. Asclepiadaceae. In: Fl. Reipubl. Popularis Sin. 63: 249–575.